

WHAT IS CLAIMED IS:

1. An information recording / reading head for recording information on a recording surface of an information recording medium or reproducing information recorded on the recording surface of the information recording medium, comprising:

a support portion which is placed above the recording surface of the information recording medium and whose position relative to the recording surface can be changed by a position control device in a predetermined direction parallel to the recording surface;

a probe whose one side is supported by the support portion and whose the other side extends to the recording surface; and

a guard which is supported by the support portion and which is placed in the vicinity of the probe,

the guard being placed at a position which is a predetermined distance away from the recording surface,

the guard being placed at least on a forward side of the probe in a situation that the relative position of the support portion is being changed in said predetermined direction.

2. The information recording / reading head according to claim 1, wherein the guard is placed around the probe.

3. The information recording / reading head according to claim 2, wherein the guard is circular.

4. The information recording / reading head according to claim 1,  
wherein the guard is U-shaped.

5. The information recording / reading head according to claim 1,  
5 wherein the guard is placed only at a position on the forward side of  
the probe in the situation that the relative position of the support  
portion is being changed in said predetermined direction.

6. The information recording / reading head according to claim 1,  
10 wherein a distance between a portion of the guard closest to the  
recording surface and the recording surface is longer than a distance  
between a tip portion of the other side of the probe and the recording  
surface.

15 7. The information recording / reading head according to claim 1,  
wherein a distance between a portion of the guard closest to the  
recording surface and the recording surface is equal to a distance  
between a tip portion of the other side of the probe and the recording  
surface.

20 8. The information recording / reading head according to claim 1,  
wherein a distance between a portion of the guard closest to the  
recording surface and the recording surface is from 10 to 120  
nanometers.

25 9. The information recording / reading head according to claim 1,

further comprising a moving device for moving the probe in a direction substantially perpendicular to the recording surface of the information recording medium.

5 10. The information recording / reading head according to claim 9, wherein the moving device is constructed by attaching the probe to the support portion through a piezoelectric material.

11. The information recording / reading head according to claim 1,  
10 further comprising a moving device for moving the guard in a direction substantially perpendicular to the recording surface of the information recording medium.

12. The information recording / reading head according to claim  
15 11, wherein the moving device is constructed by attaching the guard to the support portion through a piezoelectric material.

13. The information recording / reading head according to claim  
11, wherein the moving device is constructed by forming the guard by  
20 using a piezoelectric material.

14. The information recording / reading head according to claim 1, wherein the probe is formed of a carbon nanotube.

25 15. The information recording / reading head according to claim 1, wherein the probe is a cantilever provided with a cantilever arm and

a projection mounted on a tip portion of the cantilever arm.

16. The information recording / reading head according to claim 1,  
wherein

5 the information recording medium is a dielectric substance,  
and

the probe records information by applying a voltage to the  
information recording medium.

10 17. The information recording / reading head according to claim  
16, wherein the guard is constructed from an electrode in which a  
predetermined electrical potential is set or earthed.

15 18. The information recording / reading head according to claim 1,  
wherein

the support portion has a support surface which spreads in a  
direction parallel to the recording surface of the information  
recording medium and

a plurality of probe units, each of which is constructed from  
20 the probe and the guard, are provided on the support surface.

19. The information recording / reading head according to claim 1,  
wherein

the support portion has a support surface which spreads in a  
25 direction parallel to the recording surface of the information  
recording medium,

a plurality of the probes are provided on the support surface,  
and  
the guard is placed around the plurality of the probes.